

Report Information
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Filtering image sequences corrupted by mixed noise using a new fuzzy algorithm.

Accession number & update

0009461681 20070603.

Conference information

2006 International Conference on Image Processing, Atlanta, GA, USA,
8–11 Oct. 2006.

Source

2006 International Conference on Image Processing, 1996, p. 4 pp., 11 refs, pp. CD-ROM, ISBN:
1-4244-0481-9. Publisher: IEEE, Piscataway, NJ, USA.

Author(s)

Saeidi-M, Moradi-M-H, Sagafi-F.

Author affiliation

Saeidi, M., Moradi, M.H., Sagafi, F., Iran Telecommun. Res. Center, Univ. of Technol., Tehran, Iraq.

Abstract

In this paper, we will propose a novel fuzzy method in image sequences filtering. The proposed filter assigns **adaptive** weights based on exponential membership functions and use **averaging** filter for attenuating noise. Our proposed algorithm in image sequences filtering is much more better than the previous algorithms, Specially if images are corrupted by mixed noise, our proposed method attenuates noise and **preserves** edges much more better than the previous methods. Our proposed fuzzy algorithm don't need estimating motion trajectory because their assigned weights to noisy pixels are **adaptive** and use the correlation of pixels well enough. The proposed filter could remove mixed noise admissibly without requesting to know Gaussian noise **variance** or salt & pepper noise density. It is shown experimentally that the proposed filter can **preserve** image structures and edges under motion while attenuating noise, and thus can be effectively used in image sequences filtering.

Descriptors

ADAPTIVE-FILTERS; FUZZY-LOGIC; IMAGE-DENOISING; IMAGE-MOTION-ANALYSIS;
IMAGE-SEQUENCES.

Classification codes

B6135 Optical-image-and-video-signal-processing*;
B6140B Filtering-methods-in-signal-processing;
C5260B Computer-vision-and-image-processing-techniques*.

Keywords

image-sequence-filtering; mixed-noise-corruption; fuzzy-algorithm;
adaptive-weight; exponential-membership-function; **edge**-preservation;
image-motion.

Treatment codes

P Practical;
T Theoretical-or-mathematical;
X Experimental.

Language

English.

Publication type

Conference-paper.

Availability

CCCC: 1 4244 0481 9/2006/\$20.00.

Publication year

1996.

Publication date

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Edition

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Copyright statement

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Evaluating an adaptive windowing scheme in speckle noise MAP filtering.**Accession number & update**

0007510429 20070101.

Conference information

Proceedings 15th Brazilian Symposium on Computer Graphics and Image Processing, Fortaleza-CE, Brazil, 7-10 Oct. 2002.

Sponsor(s): Brazilian Comput. Soc.(SBC); Brazilian Nat. Council for Res.(CNPq); Brazilian Commission for Higher Educ.(CAPES).

Source

Proceedings 15th Brazilian Symposium on Computer Graphics and Image Processing, 2002, p. 69-75, 13 refs, pp. xvi+440, ISBN: 0-7695-1846-X. Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA.

Author(s)

Medeiros-F-N-S, Mascarenhas-N-D-A, Marques-R-C-P, Laprano-C-M. Editor(s):
Goncalves-L-M-G, Musse-S-R.

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Abstract

Synthetic aperture radar (SAR) images are corrupted by speckle noise, which degrades the quality and interpretation of the images. Speckle removal provides a better interpretability of SAR images if the technique performs the filtering without loss of spatial resolution and **preserves** fine details and edges. This work aims to redefine the neighborhood areas around the noisy pixel and in this area the local **mean** and **variance** are computed to estimate the Maximum a Posteriori (MAP) filter parameters. The proposed modified MAP algorithm improves the ability to filter the speckle noise without blurring edges and targets by applying the MAP estimator in the current **adaptive** window that is controlled by a measure of homogeneity in the area around the noisy pixel. This **adaptive** windowing was also incorporated to the classical Kuan et al. (1985) and Frost et al. (1982) filters in order to evaluate the performance of the proposed scheme. The effectiveness in reducing speckle by the modified MAP filter is evaluated in terms of qualitative and quantitative aspects such as line and **edge preservation** and the improvement of the signal to noise ratio. The tests were performed in real SAR images.

Descriptors

FILTERING-THEORY; IMAGE-DENOISING; MAXIMUM-LIKELIHOOD-ESTIMATION;
RADAR-IMAGING; SPECKLE; SYNTHETIC-APERTURE-RADAR.

Classification codes

B6135 Optical-image-and-video-signal-processing*;
B6140B Filtering-methods-in-signal-processing;
B0240 Probability-and-statistics;
C5260B Computer-vision-and-image-processing-techniques*;
C1260S Signal-processing-theory;
C1140 Probability-and-statistics.

Keywords

adaptive-windowing-scheme; speckle-noise-MAP-filtering; synthetic-aperture-radar-images; image-interpretation; spatial-resolution; Maximum-a-Posteriori-filter-parameters; modified-MAP-algorithm; performance; **edge**-preservation; **line**-preservation; signal-to-noise-ratio; SAR-images.

Treatment codes

T Theoretical-or-mathematical;
X Experimental.

Language

English.

Publication type

Conference-paper.

Availability

CCCC: 1530-1834/02/\$17.00.

Digital object identifier

10.1109/SIBGRA.2002.1167126.

Publication year

2002.

Publication date

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Edition

2003003.

Copyright statement

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A hybrid sigma filter for unbiased and edge-preserving speckle reduction.

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0005119223 20070101.

Conference information

1995 International Geoscience and Remote Sensing Symposium, IGARSS '95. Quantitative Remote Sensing for Science and Applications, Firenze, Italy, 10-14 July 1995.
Sponsor(s): IEEE Geosci. & Remote Sensing Soc; URSI.

Source

1995 International Geoscience and Remote Sensing Symposium, IGARSS '95. Quantitative Remote Sensing for Science and Applications (Cat. No.95CH35770), 1995, vol.2, p. 1409-11 vol.2, 7 refs, pp. 3 vol. lxvi +2331, ISBN: 0-7803-2567-2. Publisher: IEEE, New York, NY, USA.

Author(s)

Alparone-L., Baronti-S., Garzelli-A. Editor(s): Stein-T-I.

Author affiliation

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Abstract

An enhanced version of Lee's sigma filter is derived and proposed for unbiased filtering of images affected by multiplicative noise with speckle statistics. Instead of the plain point value, a more accurate start value is first produced, and then fed to the procedure of conditional **average**. A robust estimate of the nonstationary **mean** is defined according to a decision rule borrowed from the FIR-median hybrid filters, thus improving the performance also for impulsive noise. The start value is provided by a nonlinear decision rule aimed at rejecting noise spikes, which is undertaken on the **averages** computed within four isotropically balanced pixel sets able to capture step edges and thin lines. The level range of pixels to be **averaged**, adaptively defined as the product of the space-variant **mean** estimate by the constant noise **variance**, is also forced to account for the imbalance of the noise distribution, for unbiased processing. Comparison tests performed on images affected by synthetic speckle, simulating both one-look and multi-look statistics, show significant improvements over the basic scheme, as well as over Kuan's and geometric filter, resulting in lower distortion between noise-free and processed images. Also visual comparisons on a true NASA/JPL AIRSAR image, establish the superiority of the novel scheme.

Descriptors

DIGITAL-FILTERS; GEOPHYSICAL-SIGNAL-PROCESSING; GEOPHYSICAL-TECHNIQUES; RADAR-IMAGING; REMOTE-SENSING-BY-RADAR; SPECKLE; SYNTHETIC-APERTURE-RADAR.

Classification codes

A9385 Instrumentation-and-techniques-for-geophysical-hydrospheric-and-lower-atmosphere-research*;
A9190 Other-topics-in-solid-Earth-physics;
A9365 Data-and-information-acquisition-processing-storage-and-

dissemination-in-geophysics;
B7710 Geophysical-techniques-and-equipment*;
B7730 Other-remote-sensing-applications-in-Earth-sciences;
B6320 Radar-equipment-systems-and-applications;
B6140C Optical-information-image-and-video-signal-processing.

Keywords

geophysical-measurement-technique; radar-remote-sensing; radar-imaging; speckle-reduction; image-processing; synthetic-aperture-radar; SAR-imaging; hybrid-sigma-filter; **edge-preserving-speckle-reduction**; Lee; Lee's-sigma-filter; unbiased-filtering; multiplicative-noise; start-value; decision-rule; noise-spike-rejection; land-surface; terrain-mapping; AIRSAR.

Treatment codes

P Practical;
T Theoretical-or-mathematical.

Language

English.

Publication type

Conference-paper.

Availability

CCCC: 0 7803 2567 2/95/\$4.00.

Digital object identifier

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Publication year

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Publication date

19950000.

Edition

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Copyright statement

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Compared performances of morphological, median type and running mean filters.

Dialog eLinks

Full text options [USPTO Full Text Retrieval Options](#)

Accession number & update

0004510375 20070101.

Conference information

Visual Communications and Image Processing '92, Boston, MA, USA, 18-20
Nov. 1992.
Sponsor(s): SPIE.

Source

Proceedings of the SPIE - The International Society for Optical Engineering,
{Proc-SPIE-Int-Soc-Opt-Eng-USA}, 1992, vol. 1818, p. 384-91, 13 refs, CODEN: PSISDG, ISSN:
0277-786X, USA.

Author(s)

Wang-D, Ronsin-J, Haese-Coat-V.

Author affiliation

Wang, D., Dept. of Electron. Eng., Shandong Polytech. Univ., China.

Abstract

Very simple output distribution expressions of erosions and openings are given for independent non-identically distributed inputs. The output means and **variances** for input signals plus white Gaussian,

bi-exponential, and uniform noises are analyzed and computed. These results are used to compare the performances of morphological filters with those of median filters, alpha-trimmed **mean** filters, ranked-order filters and running **mean** filters. The comparisons show that morphological filters achieve the best **edge preservation** for all three kinds of noises. morphological filters are the best for uniform noise, median filters are optimal for bi-exponential noise, and running **mean** filters for Gaussian noise. Performances of alpha-trimmed **mean** filters spread between those of media ad linear filters, while performances of ranked-order filters are compromises between those of erosions (or dilation) and median filters.

Descriptors

FILTERING-AND-PREDICTION-THEORY; IMAGE-PROCESSING; MATHEMATICAL-MORPHOLOGY; NOISE; VARIATIONAL-TECHNIQUES.

Classification codes

B6140C Optical-information-image-and-video-signal-processing*;
C1250 Pattern-recognition*.

Keywords

alpha-trimmed-mean-filters; image-processing; output-distribution;
independent-non-identically-distributed-inputs; **variances**;
performances; **edge**-preservation; morphological-filters; uniform-noise;
median-filters; bi-exponential-noise; **running**-mean-filters; Gaussian-
noise; ranked-order-filters.

Treatment codes

T Theoretical-or-mathematical.

Language

English.

Publication type

Conference-paper; Journal-paper.

Availability

CCCC: 0 8194 1018 7/92/\$4.00.

Publication year

1992.

Publication date

19920000.

Edition

1993042.

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On edge preservation in multiresolution images.**Dialog eLinks**

Full text options [USPTO Full Text Retrieval Options](#)

Accession number & update

0004351550 20070101.

Source

CVGIP: Graphical Models and Image Processing, {CVGIP-Graph-Models- Image-Process-USA}, Nov. 1992, vol. 54, no. 6, p. 461-72, 19 refs, CODEN: CGMPE5, ISSN: 1049-9652, USA.

Author(s)

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Author affiliation

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Abstract

Multiresolution image processing and analysis has become popular in recent years. One of the most important factors for the success of such systems is the **preservation** of edges in the process of

producing images with reduced resolutions. Ten image reduction methods are introduced and a comparative evaluation is presented by using a set of synthetic test images and several real images. The quantitative evaluation employs an error measure based on normalized **mean**-square errors and a set of well-defined image parameters. The **edge** separation parameter is found to have a strikingly decisive impact on **edge preservation** in the context of image reduction. Noise and **edge** width also show their significant effects. A normalized local intensity **variance** is studied to bridge the gap between the simple synthetic images and the real images. Finally, suitable methods for producing multiresolution images are recommended.

Descriptors

EDGE-DETECTION.

Classification codes

B6140C Optical-information-image-and-video-signal-processing*;

C1250 Pattern-recognition*;

C5260B Computer-vision-and-image-processing-techniques.

Keywords

multiresolution-image-processing; multiresolution-image-analysis;
edge-preservation; image-reduction; synthetic-test-images; real-
 images; error-measure; **normalized**-mean-square-errors; image-
 parameters; **edge**-separation; **edge**-width; normalized-local-intensity-
variance.

Treatment codes

T Theoretical-or-mathematical.

Language

English.

Publication type

Journal-paper.

Availability

CCCC: 1049-9652/92/\$5.00.

Publication year

1992.

Publication date

19921100.

Edition

1993007.

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Search Strategy

No.	Database	Search term	Info added since	Results
1	INZZ	edge ADJ (preserv\$5 OR adaptive)	unrestricted	1370
2	INZZ	edge-preserv\$5 OR edge-adaptive	unrestricted	414
3	INZZ	1 OR 2	unrestricted	1370
4	INZZ	edge ADJ (preserv\$5 OR adaptive) OR edge-preserv\$5 OR edge-adaptive	unrestricted	1370
5	INZZ	(mean OR averag\$3) AND varianc\$2	unrestricted	16372
6	INZZ	3 AND 5	unrestricted	27

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